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ABSTRACT

Papers presented at a conference/workshop that focused on the subject of increasing minority representation in the fields of allied health and science are provided. The role of undergraduate education in preparing students for allied health careers and suggestions for curriculum planning and development are given in the first two papers by Mary E. Milliken and Ralph C. Kuhli. These are followed by a presentation on the teaching of communication skills in preparing students for careers in allied health, with emphasis on minority students by William G. Pickens and two papers on consortia arrangements for allied health programs by Phillip H. Bucken and Randal Carter. The remaining papers and authors deal with: (1) selective recruitment of minority students for allied health programs (Eddie Morris); (2) Project Black Awareness - Health Careers (Carolyn Russell); (3) retention through student support programs in science (Carolyn Russell), (3) retention through student support programs in science (Winifred Harris); and (4) supportive services for minority students of sciences (Herman Young). (SPG)

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MINORITY STUDENTS IN ALLIED HEALTH AND SCIENCE

A Conference Report

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
NATIONAL INSTITUTE OF EDUCATION

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Institute For Higher Educational Opportunity

Southern Regional Education Board

April 1976

Conference Objective

The conference/workshop focused upon a vital concern of the Institute for Higher Educational Opportunity of the Southern Regional Education Board. That is, increasing minority representation in the fields of allied health and science. In this changing technological era, minority students will have to prepare themselves for new and different careers. The oversupply of black professionals in the fields of education and social sciences, plus the current preference of minority students for these careers makes the need for this meeting obvious.

It is hoped that the strategies presented will be helpful to institutions as they seek to develop programs to increase minority participation in these underrepresented fields.

Appreciation is expressed to the conference planning committee, program presentors, and participants for their contributions to this conference. Hopefully, the information provided in this report will assist institutions in their efforts to provide equal educational opportunity for all.

Jacqueline J. Irvine
Program Associate
Institute for Higher
Educational Opportunity

Participating Institutions

American Medical Association
Arkansas State University
Auburn University
Clark College
Dillard University
Emory University
Florida International University
Fort Valley State College
Georgia State University
Health Manpower Development Corp.
Kentucky State University
Louisiana Tech. University
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The Role of Undergraduate Education in Preparing Students for Allied Health Careers

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The existence of a course of instruction can be justified only on the basis of payoff--the results it achieves. Unless the course leads to improved performance by participants, the investment has wasted the teacher's time and effort, and each participant's time, effort, and money. Until recently, it has been customary in educational circles to look only at investments in educational pursuits and seek greater and greater investments, without giving attention to the outcomes of the process. Essentially, the value of a course of instruction has been based on the amount of input regardless of whether or not any identifiable change was effected in a learner. Exposure has been equated with results. Papers certifying to a specific amount of exposure have been widely used in society to select individuals for specific opportunities on the assumption that the credentials which certify to exposure also certify to competence.

The focus is shifting, however, from inputs to outcomes; from exposure to learning opportunities to demonstration of specific competencies gained from a learning experience. We now recognize that the payoff for an educational investment should be both observable and measurable. This shift has highly significant implications for all involved in planning, implementing and evaluating instructional programs. It has particular significance for those whose instructional programs are designed to prepare individuals for responsible on-the-job performance.

In designing an occupational education program, the first and essential question is, "What job competencies must students be able to demonstrate upon completion of this program, to qualify for employment as an entry worker?"

Note that the question limits the scope of competencies to include only those of an entry worker, not those of an old hand in the occupation. The validity of an occupational course of instruction is derived from the degree to which it prepares workers for on-the-job performance at or above the minimal acceptable standard, as viewed by the employer. Validity for an occupational program is derived from the occupation itself. In a dynamic occupation, validity is low if the preparatory program is based on tradition or on courses as they were designed when the teacher was a student. This

mandates that the job *per se* must serve as the primary source of data for the decisions to be made in instructional planning. Any occupational course should be tested against the experience and expectations of:

- Current employers
- Job incumbents
- Recent graduates
- Presently enrolled students
- Teachers

The teacher of an instructional program which has the expressed purpose of preparing personnel for jobs in the health field has a responsibility to keep curriculum content current with on-the-job performance requirements. Fulfilling this responsibility requires that the teacher conduct an ongoing assessment of the instructional program in terms of data obtained through regular contact with the employment situation.

The use of this analysis data enables the instructional planner to develop a curriculum which has a high level of validity for on-the-job performance requirements. The teacher has the responsibility for preparing employees in accordance with the expectations of those who will employ graduates of the program. These employer expectations may well be the demands which will be made of the worker--your graduate-- and the basis on which that worker's performance will be judged.

One means of assembling data for assessing the instructional program is occupational analysis. The purpose of the occupational analysis is to identify those behaviors--performance capabilities--which are essential to successful on-the-job performance. When these behaviors have been identified, they can be stated as performance specifications. A set of performance specifications, then, is the goal of an occupational analysis which is conducted to provide a basis for instructional planning. This set of performance specifications should describe those behaviors which are critical to successful entry and adaptation to the job.

The roles and responsibilities of health workers will change from time to time. Tasks performed by one group of workers will be assumed by another group. New responsibilities and new tasks will emerge, as health technology advances. New kinds of equipment will mean new tasks or changes in familiar tasks. The curriculum must be dynamic, ever-changing.

The teacher who accepts responsibility as a planner in this age of technology must continuously seek feedback related to the effectiveness of the program to prepare students adequately as employees. Manifestations of dissatisfaction of students or employers should be recognized as evidence of problems of relevance and/or validity. Steps should be taken

to gather full information on sources of dissatisfaction, specific complaints, or unsatisfactory performance. Then modifications can be planned to bring about the desired improvement.

The task of the educator, then, is to set up learning sequences through which students can become capable of employment performance required to monitor these sequences through intermittent contacts with employers and their employees (former students), and apply the information gained to the ongoing effectiveness of the instructional program.

It is through use of this type of curriculum planning that we can provide students with a relevant curriculum and employers with entry-level workers who can fulfill the required functions.

The Role of Undergraduate Education in Preparing Students for Allied Health Careers Suggestions for Curriculum Planning and Development

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The words medical and health are not synonymous and should not be used interchangeably. Much more than medical care is needed to assure the "state of complete physical, mental and social well-being and not merely the absence of disease or infirmity" which is so often quoted from the first sentence of the World Health Organization constitution as a definition of health.[1] Medical care is part of health care; allied medical personnel are part of the total allied health personnel. Physicians, other independent practitioners, and allied medical professionals serve together as a medical care team which provides medical services to patients. Allied health occupations can be considered to include a comprehensive range of professions and services. Those allied health occupations which work with or under the direction and supervision of physicians in providing services to patients are occupations which the American Medical Association calls "allied medical."

It might be helpful to report briefly on three aspects of undergraduate allied health education:

- History of allied health occupations
- Accreditation of allied health educational programs
- Curriculum planning services.

History of Allied Health Occupations

For centuries medical care was provided by the physician. Early in the nineteenth century it became obvious that the patient needed many services which did not require the long education supervised experience it took to prepare a physician, so the profession of nursing developed. Both the physician and the nurse are concerned with the total care of the patient.

Shortly after the beginning of this century, new kinds of patient services were developing, and this called for new kinds of health personnel. As recorded in the January 13, 1900, issue of Journal of the American Medical Association JAMA, "the accidental or semi-accidental discovery by Roetgen of the rays that bear his name" just four years earlier presaged the x-ray equipment and allied health occupations which followed. Incidentally, 75

years ago JAMA reported, "One fact that is particularly suggestive is that certain salts of the element uranium and certain derivatives of pitch-blende possess the property of giving off these rays . . . ."[2]

Increasingly complex forms of diagnosis and treatment called for larger laboratories with non-physician personnel capable of work in hematology, serology, histology, and blood banks; physicians accepted physical therapy as a valued tool for treatment; inhalation therapy became a major medication vehicle; the use of cobalt and linear accelerator machines required personnel with specialized training; x-ray equipment in many forms required trained non-physician personnel; and voluminous medical records, administrators and technicians capable of coping with the paper involved.

Unlike physicians and nurses, these allied health workers are not concerned with total patient care; such allied health workers are specialists: Their education and experience are concentrated in just one part of the total services for patients. This is why allied health workers can contribute to better patient care; physicians are the first to say that there are certain things which can be done best by qualified non-physician health professionals.

For each practicing physician there are a dozen other health workers, and this ratio continues to grow as physicians delegate more tasks and the public requests more medical care services paid by insurance. Physicians, nurses and allied medical professionals work as a team in providing the best possible diagnosis and treatment for the patient -- and that includes health maintenance for all people.

Accreditation of Allied Health Educational Programs

AMA involvement in allied health education began early in the 1930's when the American Occupational Therapy Association and the American Physical Therapy Association asked the AMA to cooperate in setting standards Essentials for educational programs and in accrediting educational programs that met or exceeded those standards. Since that time, additional medical specialty and allied health organizations have urged the AMA council on medical education to cooperate in the accreditation of educational programs for additional occupations. Now 29 organizations collaborate with the AMA council on medical education to accredit educational programs for 26 allied medical occupations. The council is recognized by the U.S. Commissioner of Education as the coordinating agency for the accreditation of 18 of those occupations.

There are 2,571 AMA-accredited allied medical educational programs. Of these, approximately 2,100 are located in hospitals, 250 in four-year colleges, and 200 in junior/community colleges. The total number of institutions, including hospitals, sponsoring three or more AMA-accredited educational programs in 1972 was 172.

Allied health education is available to students who want to and who are able to qualify themselves for entry into the educational programs selected. Allied health jobs are open to qualified applicants; the emphasis is on qualification rather than race, color, or creed. The concern is for quality, so that patients will get the proper care which is necessary.

Information on assistance for students is in the 400-page Allied Medical Education Directory[3] published by the American Medical Association. Information on these occupations is included.

Occupational Title		No. of AMA-Accredited Programs 1-15-76
* 1.	Assistant to the Primary Care Physician	49
* 2.	Cytotechnologist	103
3.	Electroencephalographic Technician	6
4.	Electroencephalographic Technologist	-
* 5.	Histologic Technician	25
* 6.	Laboratory Assistant	158
* 7.	Medical Assistant	97
8.	Medical Assistant in Pediatrics	2
* 9.	Medical Laboratory Technician	31
*10.	Medical Record Administrator	39
*11.	Medical Record Technician	58
*12.	Medical Technologist	703
*13.	Nuclear Medicine Technician	-
*14.	Nuclear Medicine Technologist	87
*15.	Occupational Therapist	43
16.	Operating Room Technician	6
17.	Opthalmic Medical Assistant	0
18.	Orthopedic Physician's Assistant	4
*19.	Physical Therapist	72
*20.	Radiation Therapy Technologist	58
*21.	Radiologic Technologist	815
*22.	Respiratory Therapist	144
*23.	Respiratory Therapy Technician	42
*24.	Specialist in Blood Bank Technology	62
25.	Surgeon's Assistant	2
26.	Urologic Physician's Assistant	1

* The U.S. Commissioner of Education recognized the AMA Council on Medical Education and collaborating organizations to accredit educational programs for these occupational categories.

Curriculum Planning Services

Essentials for an accredited educational program are documents which outline minimal standards that an educational program must meet to be accredited by the AMA. They are drafted and approved by the collaborating organizations, channeled through the AMA council on medical education and its advisory committee on allied health education, and adopted by the AMA house of delegates. Both the AMA house of delegates and the collaborating organizations must approve the Essentials before they are adopted.

The collaborating organizations sponsor review committees which provide service to educational programs seeking accreditation, including sending evaluation teams to make site visits for the purpose of working with institutions in the evaluation of educational programs. The review committees then make recommendations concerning accreditation to the council on medical education, which accredits programs.

To assist hospitals, clinics, colleges, and vocational, technical and proprietary schools in developing educational programs which meet or exceed these minimal standards, the AMA and collaborating organizations and their review committees have developed various kinds of aids, in some cases including guidelines and self-study outlines which are useful in curriculum planning and development.

In addition, substantial amounts of consultation services are provided by field work, at meetings of various kinds, by mail and telephone, and during the site visits of evaluation teams.

Financial Assistance

The American Medical Association has urged Congress to provide more federal financial aid to students. The AMA believes that:

> Financial assistance to students is needed. Scholarships should be provided for students of high ability and performance who require financial assistance to attend medical school or other schools of the health professions. These programs of financial aid should be clearly distinguished from the National Health Service Corps and Public Health Service Scholarships, which are contractual arrangements between the federal government and the student. Funds for student loans are also needed. These should be administered through the schools, should be based on financial need, and should be repayable either through cash payment or through service.[4]

In his statement last year to the Permanent Subcommittee on Investigations of the Senate Committee on Government Operations, U.S. Commissioner T. H. Bell reported that nine laws have been enacted this past decade involving significant changes in the Guaranteed Student Loan program. An average of about $1000 has been loaned: "Over five million students have secured more

than $8 billion in loans from approximately 19,000 private lenders." This is private money loaned with a federal guarantee of repayment -- half the program is federally insured, almost all of the rest is 80 percent federally reinsured against loss. Student financial aid should be available to students in multidisciplinary educational programs.

William F. Pierce, Deputy Commissioner for Occupational and Adult Education in the U.S. Office of Education, says that "state and local funds are largely carrying the cost of vocational education," because just 16 percent of the total funds being spent on vocational education are federal funds. The OE Division of Vocational and Technical Education reports that community college expenditures during fiscal year 1973 were $420,863,886 of state and local funds plus $63,418,926 of federal funds for a total of $484,282,812. Community colleges spent more than half of the total of $927,346,619 for vocational education in 1973 (technical institutes spent $197,054,464 and vocational-technical and other postsecondary institutions spent the remaining $236,009,343).[5]

The National Center for Education Statistics reports that two-year colleges continue to grow at a faster rate than inflation: Revenues were up 21.3 percent in 1973-1974 and expenditures were up 16.2 percent. These increases in funds received and expended reflect the continuing growth in enrollments, which rose 9.5 percent as measured by increases in full-time-equivalent students.[6]

The point of all this activity in allied health education is better and more patient care services by qualified allied health personnel working under the direction and supervision of practicing physicians.

One principle of good management is that decisions should be made at the lowest level of competency. There are many good reasons why the physician should not try to do everything in patient care. Delegation facilitates better patient care. That is why more physicians are delegating more responsibilities to more qualified non-physicians: Nurses and allied health professionals. This is not "referral." I don't see the physician as a magnet who draws patients and then refers them as though they are customers. Non-physicians should forget about national health insurance as a money machine for independent practice, using patients referred by physicians. Instead, patients need care by professionals who cooperate as a team in shared diagnosis and shared treatment.

To this end, the AMA and 29 medical specialty and allied health organizations are working together to provide services to all concerned with preparing students for allied health careers. The Southern Regional Education Board -- as a coalition of educators, government officials, and civic leaders working to advance knowledge and improve the social and economic life of the South -- can be especially helpful in encouraging more blacks to work hard in their self-education and earn the places which are available to qualified applicants on the health care team. The American Medical Association and the 29 collaborating organizations are ready, able, and willing to cooperate in this important work for more and better patient care.

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1. World Health Organization, Basic Documents. Geneva, Switzerland; Eighteenth Edition, April 1967. "Constitution", Page 1.

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4. Journal of the American Medical Association; Dec. 29, 1975 - Vol. 234, No. 13, p. 1381.

5. Inventory of State Appropriations Supporting Education for the Health Professions, FY 1971-72. October 1974, page 4. DHEW Publication No. (HRA) 75-31. U.S. Department of Health Education, and Welfare; Public Health Service, Health Resources Administration, Bureau of Health Resources Development.

6. Francis C. Nassatie, Acting Administrator, National Center for Education Statistics, Office of the Assistant Secretary for Education, in his February 26, 1975 Report to the President. (NOTE: This is identified as "preliminary data.")

The Teaching of Communication Skills in Preparing Students for Careers in Allied Health--With Emphasis on Minority Students

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The consensus is that far too few minority students are entering and completing educational programs in the health sciences. One of the chief causes seems to be deficiencies in communication skills, such as reading, writing, speaking and listening. One measure of this situation is the low verbal scores on standardized tests that often typify the minority applicant. This complex matter has engaged the attention of the media and of several language-oriented organizations, such as the Modern Language Association, the Linguistic Society of America, the National Council of Teachers of English, the Conference on College Composition and Communication, the College Language Association, and the Georgia Council of Teachers of English.

Simply because this problem for minority students is part of a larger one affecting the general population, we cannot minimize it. Simply because most standardized tests reflect a cultural bias, we cannot afford to ignore the test results, because it is often those results which determine who enters the allied health fields and professions. To minimize or ignore the problem is too easy a solution. In fact, it is no solution.

Working together, we can do better than that. And doing better does not necessarily mean waiting until the time that non-standard language patterns in the general population are licked. Social dialectologists tell us that this development is unlikely. Nor does it mean waiting until standardized tests are culture-free. Sociologists and others tell us that this development is also unlikely. Doing better, especially with respect to students in health-related fields, may well mean teaching better. I am in agreement with the key assumption underlying today's topic. The key assumption is that the improvement of the instructional process itself is a possibility and a responsibility and that such improvement can help solve the problem at hand.

I will confine my remarks to what we can perhaps do in the verbal area in higher education and especially in our predominantly minority colleges. Dr. Joseph Gayles of Morehouse College, relates the following report on verbal ability of minority college students:

> The mean entering medical school class score on the verbal ability component of the Medical College Aptitude Test (MCAT) in 1975 was 582 out of a maximum of about 700 points. The mean at Morehouse in 1975 was about 394.

Dr. Gayles claims that, even so, Morehouse was leading the pitiful handful of black colleges with any entrants into medical schools. He says that 500 is rapidly becoming the cut-off point.

Dr. Lucille Tunstall of Clark College, describes many minority students this way: "They are unsophisticated with respect to the nuances of language," she succinctly and accurately declares.

Can we illustrate what we are talking about? Can we illustrate the habits of language which are associated with this profile that I have been trying to suggest? Some papers were written within the past week by freshman at a predominantly black college. The college is not Morehouse, even though they may also represent Morehouse and other majority and minority institutions. Lots of papers in the whole group, however, were better written than these. Yet, I do think that these particular ones show some of the problems that teachers--not just English teachers, mind you--face.

Of the three papers (see Appendix), two of them must have been written by premedical students. Look at the titles they selected:

> Money is a Necessity of Life
> Money Represents Power

Of course, I am not serious. Anyone--even English majors--has that much sense about money.

As for the papers themselves, though, let me start with the third paper, the one with the title, "Should Capitol Punishment Be Abolished?" Assuredly, this title would seem to have implications either for the executive branch of government, citizens of Washington, D.C., or both. Otherwise, could it be that the young writer confuses "capitol" with "capital?" If so, a product of a different order from that of our first reaction is required. Let us look at the paper for a moment. Perhaps the form is not so bad, as far as it goes. As for the sentence structure, I have seen far worse. Yet, it is a poor paper. It suffers from malnutrition. It consists of a series of largely unsupported generalizations. For example, this is the first paragraph:

> Capitol punishment should be abolished as soon as possible.
> Capitol punishment is cruel and does not prevent crime.

The second paragraph also consists of two topic sentences, no substantiation:

> Studies have shown no unusual increase in crime when capital punishment is abandoned and no unusual decrease in the crime rate when the death penalty is adopted. As a result of capitol punishment, innocent persons have been electrocuted for crimes that they didn't commit; this is cruel.

Similarly, the final paragraph, again consisting of only two sentences, offers generalizations, not substantiation:

> Most states have only two or three offenses listed as capital crimes, and several have abolished the death penalty altogether. Many countries, including most European countries and Nations, have repealed the death penalty completely since 1900.

No distinction between "countries" and "Nations" is attempted. The paper has little body, little or no development of paragraphs, little or no interest. It offers only meager information about the writer. The whole effort is hungry and thirsty for factual support, illustration, and ememplification. The paper is little more than a sentence outline.

Let us turn again to the first paper, "Money is a Necessity for Life." It has some saving features: The organization is good; the structure of the topic sentences is good. Yet, we quickly spot some serious problems: The substance is weak and undernourished; it is unimaginative.

> In today's society and for many years, Money has been the necessity for life. In order for a person to live comfortably in today's society, one has to have money for such needs as foods, clothing, and shelter, which makes up a person's life.

There is the capitalization problem, "Money." There is the apparent disagreement between the relative pronoun "which" and the verb "makes". After these first two sentences, hardly any new element is added. Thus, the style becomes repetitious. For example, note the topic sentence for the second paragraph, "Money is necessary for buying food, which is a necessity." Aside from repetition, there are logical problems. If in paragraph one, money is "the necessity," how is that two sentences later, in paragraph two, "food" is "a necessity?"

Paragraph three offers:

> Money is also necessary in order to buy clothes. For instance, every individual has to have clothes because they shield our body from damaging weather and they also necessary for support of body. For instance, sweaters, pants and other wearing attire.

Grammatically speaking, there's disagreement two times between the possessive pronoun "our" and "body." There's an omission of the verb (are) between "they" and "also." Also, syntactically speaking, the last statement is a fragment: "For instance, sweaters, pants and other wearing attire." Faulty logic reappears. For example, it is not made clear what clothes

are "necessary for support of our body." Then, too, there is the apparently unintentional tautology in "wearing attire." Another tautology appears in the final sentence of the paper, which begins, "All of these needs are necessities...." This is another way of saying "needs are needs."

Consequently, though the writer of the first paper makes a greater effort providing detail and exemplification than the writer of the third paper, he falls into repetition, even tautology, and confused grammer and syntax.

Now, let us turn briefly to our would-be-physician who wrote essay number two, "Money Represents Power." This writer even offers a thesis statement, though disembodied: "Without money there is no power." Again, the paper's organization is not bad. Yet, there are serious problems of clarity. For example, what is the saying that is referred to in the first sentence? It goes,

"Six to seven years ago there use to be a saying, "Black Power and White Power but today there's only power." In the second paragraph, what is the meaning of the sentence, "People are doing in-and-everything to get this power?" What can we make of the first sentence of the third paragraph, "According to the Bible for the Love of money is the root of all evil?"

The last paragraph also provides a few puzzlers:

> Thus, the fact that money can buy everything, not even love. It's good to have than not to have. However, some tend to abuse it by putting their money ahead of the Lord, this is wrong. Deuteronomy 5:8 say: Thou shalt have no other gods before me.

What logic is there in the first "sentence" of the last paragraph, "Thus, the fact that money can buy everything, not even love?" Or what about the next one, "It's good to have than not to have?" As for the Biblical input, my edition of the King James must be different from that used by the writer of paper number two. In my edition the quoted line appears in Deuteronomy 5:8, not 5:7. The more significant question, though, is why should the writer, as he ends his paper, leave the subject that he selected and deal with "the Lord" and "Deuteronomy?"

These three papers, I remind you, were written in late April, 1976, near the end of an instructional period that began in September, 1975. One must assume that, taking the students where he found them, the instructor had first to concentrate on organization above all. And we see the good results of that instruction. Yet, judging by the nature of the other problems that still remain, we can only sympathize with the poor teacher as we realize what must have appeared at the first encounter with some of the students.

These papers show some of the chief composition problems to be faulty reasoning and impoverished vocabulary, inadequate paragraph development, and less-than-cultured style. This is not to mention the mechanics, such as

spelling, capitalization, punctuation, or morphology (correct inflection). The writing discloses some of the deficiencies of reading, especially the lack of wide reading, the lack of critical reading, the poverty of vocabulary, and the severity, in some cases, of oral-aural difficulties.

Instruction, I think, has first to center on attitudes. Through example and precept, teachers in communication skills and in all areas need to show a love and respect for language. Through example and precept, teachers need to try to revive the work ethic, the pride of creativity--verbal creativity of the best kind, the pride of authorship and ownership, the desire to know and to pressure--in good writing--what one knows and thinks and feels. Instruction, I think, has to center on problems of reasoning and logic, even though that kind of instruction is hard. Instruction, I think, has to center on problems of vocabulary. As all of you know, vocabulary looms large in standardized tests that provide entry to the health fields. We have to require that students own dictionaries and vocabulary workbooks. Fine workbooks are available. They center on these key areas, the test areas:

- Etymology--word derivation, with a concentration on prefixes and stems
- Antonyms
- Synomyms
- Sentence Completions (where structure and context clues play important parts)
- Analogies
- DAT Word List--definitions of 2,000 words

This kind of instructional content is likely to discourage the penchant for unstructured rappin' and encourage the penchant for more adequate learning in the English skills areas. This is the learning, I think, that will make the greatest difference at the entry level and higher levels of the allied health fields.

APPENDIX

Money is A Necessity for Life

In today's society and for many years, Money has been the necessity for life. In order for a person to live comfortably in today's society, one has to have money for such needs as foods, clothing and shelter, which makes up a person's life.

Money is necessary for buying food, which is a necessity. For example, an individual has to have food in order for his or her body to function. He or she has to have such foods as vegetables, milk, meats, etc. These are all necessary for a growing human being.

Money is also necessary in order to buy clothes. For instance, every individual has to have clothes because they shield our body from damaging weather and they also necessary for support of our body. For instance, sweaters, pants and other wearing attire.

Money is also necessary in order to buy shelter. For example, shelter also shield our bodies from damaging weather and it also keeps our bodies warm.

There are many reasons why money is the necessity for life and some of the basic reasons are for buying food, which we need for the nourishment of our bodies, buying clothes, which we need for to shield our bodies from the damaging weather and for support and also buying shelter, which is also a need for living, because it also serves as a shield for our bodies and it helps to keep us warm. All of these needs are necessities, and in order to obtain them a person must have money.

Money Represents Power

Without money there is no power

Six to seven years ago there use to be a saying, "Black Power and White Power but today there's only power. That power is Green Power the only power that does mostly everthing.

Money is the power we today call Green Power, the power everyone wants and needs. People are doing in-and-everything to get this power. It's Green Power we want because without it there is no black power and White Power.

According to the Bible for the Love of money is the root of all evil. From my view of it, For without money is the root of all evil. One really has no power if he doesn't have this Green Power. Money answereth just about all things where as Black Power and White Power is only talk, Green Power has the action and action speaks louder than words.

Thus, the fact that money can buy everything, not even love. It's good to have than not to have. However, some tend to abuse it by putting their money ahead of the Lord, this is wrong. Deuteronomy 5:8 say; Thou shalt have none other gods before me.

Should Capitol Punishment be Abolished?

Capitol punishment should be abolished as soon as possible. Capitol punishment is cruel and does not prevent crime.

Studies have shown no unusual increase in crime when capital punishment is abandoned and no unusual decrease in the crime rate when the death penalty is adopted. As a result of Capitol Punishment, innocent persons have been electrocuted for crimes that they didn't commit; this is cruel.

Most states have only two or three offenses listed as capital crimes, and several have abolished the death penalty altogether. Many countries, including most European countries and Nations, have repealed the death penalty completely since 1900.

Consortia Arrangements for Allied Health Programs

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The historical under-representation of minority individuals in the medical and allied health fields has been studied and reported on during recent years. For example, in an article published two years ago in the Journal of Allied Health, Blewett[1] reported that allied health training programs located in a large eastern city with a predominantly minority population received fewer than 10 percent of their admission applications from minority persons. Moreover, acceptance was awarded to less than 10 percent of that applicant group. In contrast, the acceptance rate for non-minority applications was between 40 - 50 percent of those who applied. While comparable data were not available for other locales, it hardly can be doubted that this situation is commonplace and could be found to be repeated many times over across the country.

In a recently released report entitled "Minorities and Women in the Health Fields," prepared by the HEW Bureau of Health Manpower[2], data were presented on minority persons employed in selected health occupations in the United States in 1970. The report showed that in the fields of medicine, osteopathy, dentistry, optometry, pharmacy, podiatry, and veterinary medicine, 2.2 percent of the persons working were black, and 3.3 percent were members of other racial or ethnic minority groups. The report also showed the percentage of blacks who were working in certain fields: Registered nurses (7.8 percent), dietitians (18.3 percent), health administrators (4.6 percent), clinical laboratory technicians (9.3 percent), dental hygienists (1.7 percent), health record technicians (5.0 percent), radiologic technicians/technologists (6.7 percent), dental laboratory technicians (5.4 percent), dental assistants (3.5 percent), lay midwives (39.9 percent) practical nurses (21.7 percent), and nursing aides, orderlies, and attendants (25.3 percent). Statistics were not provided for fields such as physical therapy, respiratory therapy, and others.

Despite the relatively low number of minorities already practicing in the health professions, the HEW report's data reflected that the percentage of minorities who are in training now is greater than in past years. In 1974-75, over 10 percent of the students in medical school were minorities, compared to 6.9 percent minorities who were doctors in 1970. While there are signs that minority enrollments in allied health training programs are increasing, the number of practicing minority professionals remains comparatively low.

Roberts and Plunkett[3] described some of the barriers to entry into health occupations which face minority group students. They listed the following barriers:

- High cost of health occupational training programs
- Inadequacy of active recruitment programs
- Lack of proper counseling at an early stage in the choice of a career
- Inadequate preparation of minority group students in the prerequisites required for health training programs
- Great amount of stress placed on particular admissions requirements which tend to be biased toward the middle and upper class students
- Rigid, locked-in curricula of the various programs which do not allow for sufficient self-paced learning

Consortia or cooperative approaches that are aimed at increasing minority enrollments and success in health training programs, must take these barriers and others into careful consideration if they are to be effective. Well thought-out and implemented strategies to remove the obstacles must form an essential part of inter-institutional ventures, if they are to be successful.

The establishment of cooperative relationships for training personnel is not a new strategy in the health manpower education field. Educational institutions and health care provider organizations commonly are mutually involved in training health personnel. In fact, from the educational institutions' standpoint, adequate training of qualified health personnel would not be possible without such cooperative relationships. A similar situation may exist in improving or increasing minority participation in health manpower education.

Exploration of cooperative approaches for this purpose offers an alternative to the adoption of a go-it-alone approach and seems a particular wise thing to do in these times of tight budgets and disappearing dollars. The range of possible cooperative relationships that might be structured seems quite wide, running from the very informal with oral expressions of common interests and goals to the highly formalized consortia in which there occurs heavy sharing of resources, considerable activity, written statements of priorities and agreements, and funding to support consortium staff and operations. Obviously, the extent and character of any inter-institutional cooperative venture evolves out of considerable dialogue and planning involving appropriate representatives of each institution involved.

Roberts and Plunkett[3] described several efforts which were designed to eliminate barriers confronting minority participation in health training.

For example, the University of Florida College of Medicine developed a program with five components aimed at increasing black enrollments in their health programs. One component, under the supervision of the Student American Medical Association, was designed to increase the number of black high school students who identify with health sciences careers. Interdisciplinary teams of health professionals visited and presented programs at high schools. When interest was shown, small groups of students have been invited to visit the on-campus health training center. Placement of black youngsters in summer jobs at hospitals associated with the health training center was an aim of this project.

Another aspect of this program involved visits by black medical students to predominantly black colleges to talk with upperclassmen interested in health careers. Also, medical school faculty members visited colleges, lecturing and conversing with students, counselors, and faculty.

A fourth component of the Florida program involved the organization of state college counselors to share information and establish personal contacts. The fifth component consisted of the establishment of a summer fellowship program for black college juniors, with opportunities to do independent research and attend health careers seminars at the university.

Through a jointly sponsored program by the Manhattan Central Medical Society and Columbia University, financial support enabled minority students to make up academic deficiencies over a period of a year so that those students could enter medical school better prepared.

Other examples of reported inter-institutional arrangements for student training included the following:

- Five midwestern higher education institutions entered into agreements with the states of Nebraska and South Dakota to allow students from those states to receive professional training in veterinary medicine that was not available in those two states.

- Two universities in different states agreed to reciprocate in waiving out-of-state tuition fees for students seeking training in certain prescribed programs.

- In a combined undergraduate and professional degree program, students received three years of training at Kent State University and then went on to professional schools of other institutions where, after a year of professional study, they received a bachelor's degree from Kent State.

- Five universities cooperated to assure quality supervised experience for occupational therapy students in actual treatment of patients in the hospital and clinical setting.

> Two universities cooperated to increase the number of nurses qualified to teach public health nursing in a basic collegiate school of nursing by utilizing the resources of a graduate school of nursing and a school of public health.

These very sketchy examples illustrate some of the purposes of inter-institutional arrangements.

In a booklet, Interinstitutional Cooperation at the Departmental Level, Grupe[4] admonished those contemplating cooperative ventures that there is no cookbook procedure to follow. He pointed out that "the creation of many consortia has been unsatisfactory because a simplistic belief existed that the formalization of an organization permitted the easy transfer of program ideas from one location to another." Agreements worked out in one consortium may not be easily adopted or implemented by another inter-institutional group. "Discrepant personality traits of individuals, distinctive institutional characteristics, shifting priorities of funding agencies, varying staff capabilities, technical incompatibility of equipment and the fluctuating degree of mutual trust in existence among cooperating institutions suggest a few of the situational variables within which ideas are planted." Despite such problems institutions may, with imagination and persistence, initiate approaches akin to those that have been successful elsewhere. Nevertheless, colleges will unlikely want to duplicate the exact format and content of most cooperative programs already in existence without looking at the unique dimensions of their own situation and without tailoring things to fit those dimensions.

Although many of the problems to be confronted in establishing formalized inter-institutional relationships for allied health training may not be insurmountable, they are at times formidable even where only two institutions are principally involved and where the nature and level of the proposed joint activity is reasonably clearcut and moderate. One of my functions as an allied health education administrator is to coordinate and assist our several academic departments in establishing formalized affiliations with hospitals and other health care facilities for student practical training opportunities. This process is steadily becoming more time-consuming and complex. We are a state institution, and there are statutes which regulate the kinds of agreements we can make with another institution. As an institutional member of the University System of Georgia, we must adhere to other requirements. There are also policies and procedures of the institution and school which affect the agreement process. All of these do not always interact in an agreeable fashion with the requirements of the clinical facilities and their governing bodies. Because of today's climate, legal considerations generally pose one of the main items of concern in forming such relationships. Such problems usually arise from the liability issue surrounding the direct participation of university students and faculty in the facility's patient care activity. In the pragmatic world we live in today, legal considerations influence almost everything we do. It is likely such matters will require attention in the establishment

of cooperative allied health training arrangements between academic institutions, as well.

By coordinating their efforts in the allied health field, it may be possible for some institutions to complement one another's strengths and to reduce their weaknesses for the betterment of all. Thus, through cooperative undertakings, it may be possible to obtain and maintain more flexible and better organized program offerings while limiting the diffusion of institutional resources in duplicate programming.

Grupe[4] listed several objectives which might be achieved through cooperative endeavors. Stated in allied health training terms, such objectives might include the following:

- Expand the number and variety of allied health training program opportunities available to minority students
- Share institutional allied health resources
- Reduce or eliminate unnecessary duplication in expensive allied health training programs and facilities
- Make full use of specialized faculty talents, quality program offerings, and instructional facilities
- Structure solutions to problems which are not possible to deal with effectively by a single institution
- Provide mechanisms for exchanging and disseminating information
- Develop allied health programs through which the cooperating institutions can contribute to the solution of community and regional health manpower problems
- Provide opportunities for innovative approaches to allied health education programs through joint activity

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Consortium Arrangements In Allied Health

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A consortium may have different meanings to different people and in different applications. Loosely speaking, it is a joining of two or more components into an affiliation with a view toward pooling resources and talents for effectively achieving desired goals. In most examples, there seems to be some implication of a governance mechanism in forming a consortium. However, if one accepts the definition without the aspect of governance, there are two examples that might be discussed.

One consortium in the greater St. Louis area seems to be fairly effective in its approach to health education. This consortium is composed of schools with free-standing health education programs. That is to say, the institutions themselves can mount the total program without the aid and assistance of other institutions. Initially the vice-president for health affairs at the St. Louis University school of medicine had become concerned about the proliferation of health education programs in that region. He organized these schools into a consortium so there could be some control over the growth and numbers of programs. Actually, it has worked out in terms of numbers of students recruited into the different programs. As it stands at the present time, member institutions of the consortium are not supposed to begin a new health education program unless first approved by the consortium. There is a similar consortium in Connecticut with discussion of extending it throughout the greater New England area.

It seems that these two examples of operating consortiums would neither serve the needs nor meet the purpose of the group that is present in this meeting today. Rather, it might be more appropriate to mention arrangements that could be made between traditional, four-year liberal arts colleges in an area that does not have extensive clinical facilities. In my opinion, consortium arrangements can be handled best at the individual state level for groups such as yourselves. At a recent meeting in Washington, representatives of the Association of Academic Health Centers developed a policy statement through its committee on allied health professions. The statement essentially commits the academic health centers to cooperating with consortium arrangements in the education and training of allied health professionals.

Before seriously considering the development of a consortium, whatever the scope might be, you would be wise to lay down some guidelines about the

kind of consortium desired. Several types of organizations might be beneficial in your particular efforts.

First, if there are adequate clinical teaching facilities close to your school, perhaps the best consortium is simply consultation to structure and begin the programs, as well as to establish some kind of faculty development program. At some point, this arrangement might come to resemble that consortium in the greater St. Louis area.

If there are no area clinical training facilities which could handle the scope of the program envisioned for your institution, then clinical training capability might be desirable. Again, there seems to be some commitment to this concept on the part of the academic health centers. If there is such a commitment, development with the health centers state-by-state would seem a logical approach.

On the other hand, some schools might not be interested in developing allied health programs, but want assurance that their students who complete the preprofessional portion of a curriculum can be reasonably guaranteed placement in a professional curriculum at a health education institution.

The Emory University school of medicine has such an arrangement with Clark College. Emory guarantees Clark five positions each year in our health record administration program. Students accepted at Emory under the agreement have spent their first three years at Clark and met the academic entrance requirements for the Emory professional curriculum. These students come to Emory as transfer students, and after they successfully complete the professional curriculum, Clark College awards the degree. All courses in this program are taught under Emory University course numbers by Emory University faculty. What Clark does is prepare the student to enter the professional curriculum. What Emory does is provide the professional curriculum as if they were our own students.

In another joint effort which is a little different, Emory will be assisting Clark in the performance of its undergraduate, coordinated program in dietetics. Many of Emory's faculty members will teach the courses under Clark numbers and will supervise Clark students in their clinical experiences. The Emory school of medicine is committed to this joint undertaking.

Before consortium development begins, certain groundwork must be laid, such as approach and definition of need. Is consultation and faculty development all that is required for development, or clinical experiences for students? Or is an agreement needed by which students can enter a professional curriculum after the preprofessional work at your institution? Who pays? What are the financial arrangements? These are details which Emory had to work out with Clark College. These are going to be major considerations in the development of affiliation agreements with consortiums or whatever route one might take for getting into the allied health education business. What are the guarantees? The protection? What is

to prevent a medical center from affiliating with you this year, having you get students halfway in course, and then pulling the rug out? They may simply say they can't take your students any more. These are things one must be aware of. A favorable kind of arrangement is exemplified between Emory University and Clark College in the health record administration program. Rather than Clark trying to develop independent affiliations with hospitals throughout the state of Gerogia or in the metropolitan Atlanta area, Emory prefers to work with them. It would be very expensive for Clark to develop its own programs totally. Its efforts, in a sense, would be a duplication of Emory's in such things as evaluating the facilities and making sure that students get the right kind of education once they are in the program.

There are other considerations, such as the fact that Clark College and Emory University school of medicine are both in the metropolitan Atlanta area. In this case, geographic restrictions on the students are not as great as they might be for some of the schools in south Georgia or North Carolina. Certainly, the health record program is one in which Emory could affiliate with almost any school because the students will spend an entire year at Emory in the professional curriculum; however, the coordinated undergraduate dietetics program is another matter. Students will spend part of their time in the clinical facility and then part of their time in the classroom back at Clark College. The didactic and practicum portions of the curriculum will be sandwiched throughout the last year of their program.

Integrated programs seem to restrict the geographic location of clinical sites with respect to the classroom. It would be almost impossible for a student to travel from Columbus, Georgia, spend six weeks in clinical facilities at Emory, travel back to Columbus for six weeks of classroom instruction, and then back to Atlanta for eight weeks of practicum. Moving students, the cost, the housing, the health care programs are all major problems to be dealt with in considering this kind of program.

The Emory dietetic faculty was interested in establishing a consortium arrangement with several schools in the Southeast. They brought together representatives of several colleges in Georgia, North Carolina, Alabama, and South Carolina with the idea that perhaps Emory could provide some clinical training in dietetics, with these institutions developing coordinated undergraduate programs. It has not been possible to work out the details to make such a plan feasible. Emory's dietetic internship is post-baccalaureate, so some of these schools can take their students through the baccalaureate degree; then they can apply to Emory and finish in one year.

In the case of many institutions, it might be best not to get into the allied health education business but to provide a preprofessional curriculum with an arrangement whereby students will have some measure of success in being

admitted to the professional curriculums at schools which offer them. In other words, every institution does not have to graduate allied health professionals.

Concerning economics and financing, fortunately Emory and Clark are both private institutions with somewhat comparable tuition rates. As of fall quarter, 1976, the tuition rate at Emory for our allied health programs will be $4,200 a year. There are, however, indications that the tuition does not bear the cost of educating allied health professionals -- at least in the quality of programs at Emory. Student aid is limited at Emory and has not kept pace with inflation. But there are generous tuition loans, as well as scholarships in some of the programs.

In conclusion, three decisions must be made:

- If not already in the health education business, should one even try?
- If the decision is to try, what are the resources one can bring to a partnership or a consortium?
- Once those decisions are made, what kind of an approach should be taken for allied health education?

Once these three questions are answered, a college is then in a position to approach academic health centers for assistance in allied health education programs, whether it be consultation and faculty development programs, development of clinical training sites, whether an agreement is needed to place those students completing the professional course work in a professional curriculum, or whether the school itself wants to provide part of the professional curriculum with assistance from the academic health centers.

Selective Recruitment of Minority Students for Allied Health Programs

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There are three questions that should be raised concerning minority student recruitment in allied health:

(1) Is selective recruitment any different from non-selective recruitment?

(2) Is recruitment of minority students any different from recruitment of other students?

(3) Is recruitment for allied health programs any different from recruitment of students for all programs?

The answer to all three questions is "yes," and the remainder of this presentation is an attempt to justify that answer.

Among the changes that have taken place in higher education in the last ten years, two very significant ones have been the big increase in the number of minority students attending colleges and the establishment of many new programs outside of the traditional liberal arts programs. The increased numbers of minority students who graduate from high school and who constitute a part of the pool of students to be recruited consist mainly of two groups. There are the second-generation college students, the sons and daughters of college graduates -- children of teachers, government workers, doctors and businessmen. The other group of minority potential college-goers, are what K. Patricia Cross in her book, Beyond The Open Door, calls "new students"--new in the sense that in past generations, few of these students have gone to college. It should be pointed out that there are many, many more of this kind of minority student than there are of the other kind. And more of these "new students" are going to college today. The March, 1976, issue of Jet Magazine quoted the National Center for Educational Statistics as saying that in black families with incomes of less than $3,000 per year, 41 percent of the high school graduates went on to college or vocational school. (The article also stated that about 34 percent of the white students whose parents had incomes of less than $3,000 went to college or vocational school).

It does appear then that more and more minority students desire training beyond high school. These "new students" have as much right to higher education as those who have traditionally gone to college. They constitute, along with traditional college-goers of the minority, a large pool from which to recruit students for allied health programs.

Recruitment of Minority Students

Active recruitment of minority students for allied health programs, is necessary because many of these programs are not the ones that minority students traditionally enter after they graduate from high school. Such students are not aware of many minority persons who have experienced success in these fields. They may be aware of one black doctor or nurse, but seldom have they seen a black pharmacist or x-ray technologist or physical therapist. They have little idea of the high school background needed to enter such programs. They do not know how many years of study are required to complete these programs, and perhaps, most importantly, they are skeptical of the available job opportunities once they complete such programs.

The requisite of a program of recruitment of minority students for allied health programs is to be sure that information regarding high school background needed, the composition and duration of the programs and job opportunities is available in ample forms and supplies. Colorful and interesting brochures, large posters, reply cards, curriculum activities, actual examples of minority persons who have been successful in the fields, short films and slide presentations all are effective ways of communicating with minority students.

Recruitment is of major importance. For example, Kentucky State University, which is about 80 percent black, has a nursing program which consists of 69 percent black students. On the other hand, Xavier University in New Orleans is one of very few schools with a college of pharmacy, yet the greatest student increase at the university has been the enrollment of white students in the college of pharmacy.

It is not only necessary to have adequate information available about allied health programs but it is vital that this information be shared with minority students. This is often difficult because some high school counselors do not feel that many minority students who fit into the category previously described as "new students" are able to do college work. Consequently, these students do not have the information concerning college programs shared with them as completely as other students do. The debilitating experiences that many minority students have had make them reluctant, in many cases, to ask teachers and counselors about available programs of study in higher education institutions.

For effective recruitment of minority students, personal representatives of allied health programs must directly contact minority students both in

groups and individual encounters. Representatives or recruiters must be resourceful in making arrangements to meet with minority students wherever they can get to them. Sometimes this can be done in a formal high school setting by contacting a counselor. Sometimes, though, it is difficult to get counselors to understand why you wish to meet with certain groups of students. Often, counselors say, "We had our college night last month. We don't let anyone talk to students other than at that time". There are also those counselors who "forget" to make the announcement until you arrive. There is another type who says, "We have polled our students and there is no one here who wants to talk to you." All counselors are not insensitive, though. There are many who are very interested in minority students and really work to help them. My experience as a minority recruiter of minority students from a minority institution, however, is that there are far too many of the former and not enough of the latter.

It is imperative that resourcefulness be used in getting information to minority students about allied health programs. Knowing the principal or assistant principal can often open doors. A concerned minority teacher in a school can work wonders. If all fails, though, and students cannot be seen in school, this is just a battle lost--not the war. The recess period is a good time to make contact.

Quite often, it is necessary to arrange meetings with students outside of school. Coke chats or receptions held for minority students are effective if they are held at some place in the student's neighborhood and are well advertised. Don't expect minority students to go the 10th floor of the Hilton to hear a representative talk about his RN program. They won't be there. Visiting the homes and churches of minority students is also a good way to make contact and sell programs.

A good recruitment program for minority students for allied health studies includes bringing students to the source of training. Many minority students have no idea what is involved in training to be a medical technologist, or a dental assistant, or a laboratory specialist. To see the equipment used, to hear instructions given, and to observe students working may help a student decide that what he has experienced is just the thing for his life's work.

To be really effective, recruitment of minority students should begin as early as the high school sophomore year, and certainly no later than the junior year. The reasons are so students will begin to consider college early in high school and take the special courses needed to enter a particular program.

Selection and Admissibility

Selective recruitment can have two meanings. It can mean recruiting special groups of students who are ethnically pure. It can also mean recruiting students who have certain minimum academic qualifications.

It is this second interpretation that we will examine--minimum standards of those recruited.

The real issue here is whether students who are recruited to enter allied health fields should have specific academic credentials, or whether all students who graduate from high school or who meet admission requirements of the college be recruited. (Of course, it is assumed that time would not be wasted recruiting students who were admissable.) The point here is open admissions versus qualified admissions. But the real question and certainly the a priori one is "Are certain minimum qualifications above high school graduation necessary to insure reasonable student success in allied health programs?" The nature of some allied health programs demands use of certain minimum standards for students entering the programs.

A personal experience brought me to this conclusion. At one time, I argued that student recruitment and admission should not be selective if high school graduation was achieved. I maintained that selection was the godfather of discrimination and should be avoided.

We established a nursing program at Kentucky State some years ago. Upon my recommendation any graduate of a Kentucky high school was eligible to enter, regardless of high school average or ACT test scores, just as in any other program. A large number of students were recruited for the program on that basis. Most of them did not complete the two-year program. And most of those who completed the program did not pass the state board exam. Consequently, our recruitment and admissions policies were revised.

Some attention needs to be given to courses taken in high school, especially in science and math and foreign language. In fact, recruiters should urge sophomores and juniors, to take less home economics and shop and civics, and take more biology, chemistry and algebra if they are interested in allied health. The grades made, plus ACT or SAT scores, should be considered in determining recruitment and admissions policy.

Attention also needs to be given to the high school from which the student is graduating. I have found that C+ students from some high schools can achieve as much or greater academic success than B+ students from other schools. The real indicator should be standardized test scores.

I have assidously avoided suggesting any pattern of high school courses, and I have not mentioned any desired grade point average and rank-in-class (RIC). I have not given any recommended cut-off scores on the ACT or SAT, or suggested specific guidelines, because it is so difficult to determine just what the potential and achievement of minority students are. Kenneth Clark and Lawrence Plotkin did a study several years ago which showed that black youngesters attending integrated colleges made grades significantly higher than expected. Kentucky State has done correlations of high school averages (HSA) and RIC with college GPA's on students. The correlation is low. ACT does correlations of ACT scores with freshman

grades. For our classes, we range around R = .25 to .35, which is quite low. Observations of colleagues in other schools coincide with those at Kentucky State. It appears that desire and motivation can play a big part in minority student achievement.

I do not want to close with a re-hashing of the standardized tests controversy. Quite honestly I don't know if I'm for them or against them as criteria for admission. I have gathered information on the controversy. It has left me confused. For example, Chuck Stone, in The Black Collegian November, 1975, said, "(SAT tests) are culturally biased . . . . And misused as a single predictor in college admissions, the tests are a barrier to helping minority students achieve parity in higher education." He recommends that "a five-year moratorium on all standardized testing . . . should be agreed upon."

On the other hand, the position paper in APGA's publication, Measurement and Evaluation in Guidance, July, 1972, read, "Ban testing? The role of measurement is too central, too fundamental . . . for this to be a realistic alternative." So the controversy rages.

It does appear, though, and my analyses and those of others bear this out, that the math and science portions of the ACT correlate quite well with grades for minority students, the math portion of the SAT does also. These scores (math and science) also correlate well with high school grades. Thus, it seems that since allied health fields are science-oriented, standardized test scores might have greater predictability than for other fields. The use of a cut-off score, along with other mentioned criteria, can be an effective selective device.

Remember that with allied health programs we are training people to work on the most precious possessions on this planet-US. We must take every precaution to insure a quality program and high standards. Many of these programs have their efficacy challenged through state board examinations. I can personally say, it is very embarrassing when a large number of your graduates fail the state boards.

Project Black Awareness - Health Careers

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Recruitment should be considered in an all-inclusive manner. An approach to recruitment based on these broad terms requires identifying the target group to be recruited, informing this group, motivating them when and if necessary, and doing whatever else is needed to entice them into allied health training programs.

If this sounds like a big job, it is. Good selective recruitment can mean the difference in successful completion of training. Emphasis is on completion of training because good selective recruitment will improve many of our retention problems.

It has been said that "an ounce of prevention is worth a pound of cure." The selection of good student potential, coupled with good career counseling, can be a valuable asset to the future of allied health and the health care system. The investment we make in assisting minorities with career objectives is one of these valuables.

Several years ago a survey revealed that Alabama ranked 47th of all states in numbers of trained health personnel and in availability of health care. Based on the 1970 census, Alabama has 70 black physicians, 26 black dentists and one black optometrist. Realizing the importance of career and counseling for minorities, Alabama's school of community and allied health resources in 1972 developed and implemented, through HEW's Health Resources Opportunity, a program called Project Black Awareness-Health Careers. Project Black Awareness arose from this need for more black health personnel and professionals in Alabama.

A primary goal of the project is to inform the target population of the opportunities in health careers by disseminating health careers information. This entails explaining relevant points about the health care system, and motivating students by showing them black graphics geared to their interests, providing tours of the university medical center complex, and facilitating general rap sessions.

Young blacks are like the eagle in the old fable. There was an eagle who was told for a long time he was a chicken, and he believed it. Young blacks have been told for so long that they are not smart enough for medical school or one of the other health careers, and they believe it. So we spend quite a bit of time dispelling some of the old myths--myths such as those implying that one has to be a genius to go to medical school. Realities must replace these myths.

Many of Alabama's students are first-generation college students. They have few ideas as to what to expect, first from college, and secondly from a health career. To eliminate this problem, we identify role models and encourage student interaction. This problem could also be greatly improved through good counseling.

This leads to the second objective of the project: Acquainting counselors and guidance personnel in Alabama's high schools, junior colleges, colleges and universities with the vast number of health training opportunities, and assisting them in effectively communicating those opportunities to their students. Successful communication can be achieved through black-oriented graphic materials, area workshops, television programs and local "health fairs."

The project provides professional counseling for health training programs in Alabama and referral services for training programs throughout the country. In addition, the project also works with school administrators and parents who are necessarily contacted to get students into health professional training programs. Many parents have influence over their children. Therefore, concerted efforts are made to inform them of health careers, as well.

A wide range of audio-visual materials such as "Code Blue" and "Hollah" are presented to schools and student groups. It is very important, when informing students of health careers, to utilize materials minorities can identify with. We have developed many attractive brochures and posters designed to catch their attention.

The third objective of the project is to provide a health career counseling service to blacks who are not in an academic setting, such as working mothers, veterans, drop-outs, and groups in the community, churches and professional associations. This means that project staff must be available during times other than just normal working hours.

We have also developed a special program, "TAGS" (Take A Gaint Step), directed toward entry-level hospital employees, informing those individuals who are presently employed in hospitals of the routes to improvement and promotion through training programs.

The last objective of the project is that of guiding qualified black applicants to those educational and medical institutions in Alabama with health training programs. In addition, the project works with premedical and predental students who are unable to matriculate into schools of their choices. This serves as an excellent resource pool for the recruitment to allied health professions.

Project Black Awareness facilitates entrance into health training programs not just at UAB, but to any health career training program in the state or nation.

Students are assisted in matching their interests with a career. They are also encouraged to select career alternatives. Students are directed into

the areas of greatest need for the state. They are also counseled on the state's projected manpower needs for the health career they are interested in. The type of services provided, the type of institutions where specific health personnel can work, salary and other information of this nature is given to students prior to their decision to enter a training program. This eliminates disillusionment that many students have previously experienced during training and in the job placement process.

Another project directive is the recruitment of blacks from rural Alabama where the state's resources, in terms of counseling and guidance personnel and health manpower are limited. Higher-level allied health professions, such as inhabitive therapy and medical records administration, is also encouraged.

When Project Black Awareness - Health Careers began at the University of Alabama in Birmingham, there were very few students enrolled in the school of community and allied health resources. At the present time, blacks comprise 25 percent of the total enrollment of the school. This is comparable to the percentage of blacks in the state.

Since the beginning of program activity, more than 40,000 black youths have been contacted directly by members of the project staff. Based on one-to-one counseling geared to students' needs or requests, the project assists approximately 100 students yearly in the application process to health career training programs. The project is also working with over 300 guidance and counseling personnel in 200 educational and community institutions and installations in the state.

Evaluation is now underway to determine the project's effectiveness. It is the feeling of educators, counseling and guidance personnel, and health providers that Project Black Awareness - Health Careers has made a remarkable impact on the health manpower need of the state and is a highly successful program for the recruitment of blacks into health professions.

Retention Through Student Support Programs In Science

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Student support in this context does not refer specifically to financial support. At Clark, however, 80 percent of the students receive some type of financial aid. Thus, if there is to be any retention at all, financial aid must be part of the equation.

There are two programs at Clark College which address themselves to the topic. The Premedical Orientation Program offers retentive support to premedical and science students in their attitudinal development toward premedicine, establishing an atmosphere for peer reinforcement, and helping eliminate psychological and emotional barriers that could otherwise lead to dropping out of school or to a change of major. The other program, The Rowland Scholars Program, is designed for the high school graduate who has good potential for college work but who may have deficiencies in communication skills and in the sciences. It is also designed for the superior high school student with science preparation adequate for college level work. This student can enroll in summer courses for college credit. Both programs are supported by grants. The former program is especially relevant to student support.

The Premedical Orientation Program is funded by the Lewis Calder Foundation to increase the pool of blacks getting into medical school. Assessing the situation at Clark College, two factors became apparent. First, of the several hundred students admitted to the freshman class, relatively few express preference for a medical, allied health or scientific career. The majority are going into the social sciences. Secondly, of those who enter with medical and or scientific preferences, about 10 to 15 percent of them graduate.

It was apparent that to get more students into medical school, allied health areas and other scientific careers, we must recruit them and retain them. The key variable in our plan was student attitude. Typically, as many as 10 to 15 percent of an entering freshman class will indicate a desire to enter these fields. Within less than a year, however, this number dwindles quickly, despite faculty efforts to establish early contact with these students and work closely with them.

Premedical students and those in other science programs are some of the most academically burdened undergraduates at Clark. On a warm afternoon, when most classmates are stretched out on the lawn and stereos are blaring across

campus, it is easy for those few young men and women in the laboratory to question whether they really want to subject themselves to the work involved. Peer reinforcement of values and behavior is vitally important to all adolescents; if there are many students who share the same career goal, they give mutual support to each other.

Several other problems can also be identified among the premedical students. Students have had only limited, if any, exposure to physician role models with whom they can identify. Some have not examined this career choice beyond the point of noting that many doctors drive Cadillacs; other students have been poorly counseled and do not fully realize the long training process involved in becoming a doctor; few of the students wishing to become physicians comprehend, before matriculation, the rigorous nature of the premed curriculum. The elimination of these and other informational deficiencies should receive high priority. In addition, the undergraduate who intends to become a physician faces the critical problem of financing his education. We feel strongly that if students can be identified early, counseled well and their motivations kept high, we can help them cross the financial hurdles.

In cooperation with the admissions office and college recruiters, Clark College has launched a recruitment campaign. Faculty and premedical students have visited several high schools. Physicians and high school counselors who are Clark alumni will be asked to help identify students who have demonstrated an aptitude for science.

A simple informational brochure describing premedical education at Clark will supplement these direct contacts. This device has been enormously successful with other programs at Clark.

Once students have been identified, recruited, and have applied to and been accepted by Clark College, they are invited to a week-long, intensive orientation session immediately preceeding the college's freshman orientation. In consultations with faculty and students, there was unanimous agreement that this kind of experience will have a great bearing on what happens to them during the four years of their premedical training. It is during this orientation that their interests can be captured, stimulated and directed, that they can develop close personal contact with those who will be their major professors and with upperclassmen who "know the ropes," and that, as a group, they can begin to establish <u>mutually supportive</u> relationships with each other.

The first orientation program was held last August. The week of orientation began at mid-week with registration and room assignment of the participants. This was followed by a cookout for participants, faculty and selected upper classmen. At this social, efforts were made to establish or to initiate the establishment of peer relationships.

The program officially began the following morning with a statement of purpose and objectives of the program and with welcome statements from high-ranking college administrators. The key speaker was a local prominent physician who is active in political and community affairs and who speaks

The languages of the students. There was a showing of 'Code Blue', a film about the medical profession, already proven to be important and inspirational to Clark students interested in medicine. The afternoon was spent touring Grady Hospital, one of the major medical facilities in the Southeast, where several Clark College graduates are nurses, medical technologists and physicians. Here the students could see the black medical professional in action. Clark graduates were identified and invited to meet with the students.

The following days consisted of continuing dialogue with physicians and medical students who are Clark graduates. It is important for the students to see and talk to physicians and medical students who have completed the premedical curriculum at Clark. They are the models, the assurance that <u>it can be done</u> at Clark.

Several lectures on the improvement of study skills were given. There are a few traditionally difficult courses and we invited the instructors of these courses to give at least one lecture on the study techniques the students should use in those courses. The director of testing at Clark lectured on techniques of test taking. There were several sessions aimed at helping the students develop the proper or a positive attitude toward science and premedicine. Faculty discussed and explained the premedical curriculum, and the curricula in other sciences and in allied health. Differences between the premedical curriculum at Clark and the curriculum of a generalized medical school were emphasized here, as well as in the dialogue between physicians and medical students.

During the week the students were encouraged, explicitly and implicity: "You are bright; you are able; you can become a doctor. We believe in you; we are prepared to help you". Of course, there is no way to prove the claim, but we believe that this kind of beginning and the appropriate follow-up can achieve an 80 to 90 percent retention record.

Throughout the week the students were given tests and questionnaires regarding family background, previous educational experiences, cultural experiences, work experiences and career goals; the student's self-concept and perception of his environment; whether his career choice is consistent with his interest; student study skills; and the effectiveness of the orientation program in relation to any program objectives.

This type of program is obviously imperfect. There is not any one program that has all of the answers. But, we cannot stress sufficiently the fact that teachers and students agree that this program may be one of the keys to capturing the interest of undergraduates and that encouraging the retention of their commitment to the path of premedical education can literally hinge upon this kind of intensive, week-long session. Without it, both faculty and current premed majors insist, many students who come to Clark with the intent to become physicians will continue to lose interest and ambition, become frustrated and drift away within as short a time as five to six weeks.

During the spring, selected premedical students in good standing, including those who participated in the summer orientation week, will take part in an off-campus retreat, possibly at a field research center like Highlands (N.C.) Biological Station. During this retreat there will be further opportunities for students and faculty members to discuss career plans, academic and other difficulties that may exist.

The faculty members who participated in the orientation week have remained in communication with the student participants throughout the year. It is our intention to maintain this type of communication throughout their college careers.

It is not economically possible to invite every capable student who is admitted at Clark to participate in this program. Therefore, we ask the participants to help the faculty deliver the same message to those premedical students who did not participate in the program.

To evaluate the effectiveness of the program, the following behavorial objectives have been established as guidelines. It is expected that the students who participated in the orientation program will be able to accurately discuss the premedical and medical curricula requirements; explain the relationship between the premedical and medical curricula; apply basic skills of study; exhibit the emotional, social, mental and physical behavior required for accomplishing career goals; counteract peer negative reinforcement which may interfere with career goal attainment; understand the nature and function of their chosen profession; possess attitudes and values appropriate for their chosen profession; and complete premedical, health professions and/or science curriculum at Clark College.

Supportive Services for Minority Students of Sciences

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The need for increasing the number of blacks in the natural sciences and technology can be justified from the perspectives of both minority and dominant cultures. Because of the role science plays in shaping our environment and society, minorities need to achieve full participation in scientific activities to achieve total integration into and influence upon the dominant power structure. On the other hand, the dominant culture needs the distribution of talent and genius which lies in all its racial and ethnic groups. Unfortunately, however, blacks have been severely underrepresented in science and technology. The total number of black science doctorates is less than one percent of the total science doctoral pool.

As the dominant society has recognized the severe paucity of black scientists, institutions and foundations have set goals to rectify the situation. The number of black science students is to be doubled by the beginning of the 1980's. Since the percentage of blacks is less than one percent, however, the goal of two percent is hardly enough to be morally or pragmatically earnest. This superficial goal can be achieved without examining the root of the problem, which is the great cultural divide between the dominant and minority societies. Although both groups want to increase the supply of black scientists, the failure to consider cultural differences has thwarted efforts to reach their common goal. Bridging the gap between the two cultures lies in a delivery system that is founded on data that deals with what is, rather than what ought to be. Thus, it is our contention that efforts to increase the supply of black scientists necessitates the development of a realistic, supportive services model.

The Minority Engineering Educational Effort has assessed that the real crux of the problem is that a well-established system of creating engineers and scientists for the dominant society has been ineffective in the production of minority scientists and engineers. Although we live in the same general society, watch the same television, and shop at the same Kroger, we have different attitudes about our world. The dominant society still protects the status quo; thus its values are to perpetuate a good thing. The minority culture has been traditionally kept out; thus viewing the methods of dominant society as oppressive. While good will and intentions are glorious, the nature of the individuals have not changed: The "ins" versus the "outs," or the "haves" versus the "have nots." Let us briefly

examine some of the obstacles to black achievement in science and engineering.

Considering the intellectual progress of blacks, society has conditioned us to overlook the simple behaviorist theory of stimulus-response: No reward, no shaping. Instead, society prefers to relate achievement to inheritance, as inferior and superior genes are seen as correlates of productivity. Yet the most basic systems of reward have been unavailable to blacks. The Protestant work ethic which is still one of the primary tenents of our society has worked for blacks on a very limited level. Hard work brings success only at the economics survival stage (this is evidenced in the economic gap between the races in all classes).

Although society has limited its rewards, blacks have still internalized the values and norms of the dominant culture. The Protestant work ethic has built in the need for achievement, the need for self-assertion, and the need for approval. One's worth is defined by one's achievement. Self-assertion and aggression are expected characteristics necessary to move one toward achieving one's goals. Success and hard work bring one approval and esteem from the wider community. Yet at each stage, blacks are caught in a serious dilemma. Not to achieve is to accept inferiority and self-worthlessness. Society has already mirrored an image to blacks of failure and inferiority. It has often been stated that the expectation of failure becomes a self-fulfilling prophecy. Yet, despite the fact that the social milieu has fostered low self-concepts among blacks which would lower black aspirations, blacks continue the struggle for success to satisfy their own patterned needs, needs which were also established by the socialization process.

The means by which one earns approval under the Prostestant work ethic do not work for blacks. Economic, if not physical, survival has necessitated that blacks adopt a humble and passive attitude. Blacks who are too outspoken about racial issues still run the risk of losing their jobs or being refused promotions. Even successful blacks have to be careful not to attract attention, to control aggression, to be very low-keyed or subtle about their accomplishments, careful not to rock the boat. If blacks seek to fulfill their need for self-approval, then they must adopt behaviors unrelated to achievement or self-assertion.

Related to the individual's success in satisfying his need for self-assertion is his sense of control of his environment. The Coleman report showed a difference between black and white students' sense of control over their environment; it also showed that blacks obtained a greater sense of control as they attended school with more whites. It is believed, that integration nurtured a greater sense of control and level of achievement, not because white students were merely present, but because blacks were in a proximate real world setting which proved that they can cope in any situation, not just with those who, like themselves, have been defined as inferior. From this kind of evidence, Poussaint has concluded that "a realistic inability for meaningful self-assertion is a greater inhibitor of ability to achieve than is any other variable."

Researchers have shown that the pursuit of science is strongly influenced by personality variables. Studying 64 eminent scientists, Ann Roe found that most scientists were loners, uncomfortable in social settings and preferred to work with things rather than people, and that although knowledge was valued for its own sake, scientists were intensely motivated by the need to master or control their environment and to satisfy their own curiosity. Yet, the inner city environment, the psychological framework within the black community has not been conducive toward the development of such traits. One cannot, therefore, ignore the possibility of the displaced need for assertion and control as having a direct bearing on the fact that so few blacks pursue scientific endeavors. Obviously, youth whose psychic energies are absorbed by the exigencies of daily survival have little energy to pursue intellectual curiosity and knowledge for its own sake.

Moreover, the different frames of reference between black and white cultures further compounds the problems of working out a satisfactory relationship with the system. The dominant culture operates from a cognitive perspective in which the prestige mode of communication is visual-mental. The black culture, however, operates from an affective vantage point, in which the prestige mode of communication is aural-oral. Such a difference conditions one's learning styles as well as one's preference for various disciplines. For many blacks, imagery, imitation, and feelings take precedence over ideas and word-symbolism. The discipline of science lies almost totally within the cognitive domain (although we are now re-examining the area to include social, philosophical, and moral implications). Basically, then, the discipline of science is foreign to the black cultural frame of reference.

Blacks cannot delineate parts of themselves to cognitive dominance without recognizing the affective motivations, aspirations, and the price one is willing to pay to achieve a future goal. How much of oneself, integrity, and identity must be sacrificed to obtain a viable vocation? Not even scientists have been able to quantify emotions. Figuratively, scientists are supposedly more comfortable working with things rather than people; blacks are more people-oriented. Most studies have shown that aspirations and motivations as well as ability are determiners of success. Therefore, greater attention should be focused on the affective domain.

It is well known that the majority of blacks pursue careers in the fields of the humanities, social sciences, and athletics. One obvious reason has been that the areas of education, social work, theology, art and sports have been more open to blacks and thus have provided a large number of role models for young blacks to emulate. However, these fields are also appropriate because the disciplines themselves allow resolution of personal conflicts and pursuit of issues relevant to the black predicament. Obviously, sports is one constructive and viable way for blacks to channel assertiveness. Other disciplines allow the individual to focus on the purpose of life, man's role in society, individual worth and expression. On the other hand, the sciences presume that one has already resolved these issues, as the emphasis is on the objective nature of truth. The psychological press makes it difficult for many blacks to deal simultaneously with the enormous

amount of knowledge and skills required in science and the subjective problems of one's identity.

Add to these factors the lack of a scientific tradition among blacks, the lack of role models for black youth to emulate, as well as the inadequate curriculum of many inner city schools, and one has a comprehensive picture of the factors working against black participation in science and technology. Against such a background, the exposure to science and engineering programs and the financial aid making it possible to enter hardly scratch the surface. A realistic model which we propose for not only recruiting blacks into science and engineering but also graduating them should contain the following components:

- Recruitment and career exposure
- Financial aid
- Tutorial services
- Counseling (for psychological support)
- Identity with a role model
- Experiential (or inductive) learning

Since the first two components of this model -- recruitment and financial aid -- are already in use, they need little elaboration here. Nevertheless, one should note that merely to provide a means for black students to enroll in science programs is not only tokenism but hypocrisy. Without supportive services, one is placing most blacks in a position where all the odds point to failure. If colleges admit students, they are obligated to provide meaningful avenues of success.

Tutorial services are also a standard part of supportive services, although many engineering schools are not providing them. Tutoring for such students should be well structured, built into their regular schedules and mandatory. Many black students have never developed good study habits and the self discipline to pursue an academic task. Although college personnel expect students already to be self motivated, the underprepared student needs a good deal of supervision. It has been my experience that when study sessions are considered laboratory work for a class, in which attendance is necessary for completion of the course, students attend regularly and thus improve. However, when tutorial services are offered after the normal daily routine of classes and are voluntary, attendance is very poor, and little progress is made. At first glance, one wonders whether students who have to be forced to study belong in college. The problem is not a lack of potential, but that past failures have mitigated their expectations. As they are shown how to study and can see successful results from such study, they are encouraged to continue. Many black students have not learned that their actions can determine their destinies, that by studying hard they can obtain good grades. A structured tutorial service forces them

to be successful. Their success, in turn, fosters self-motivation. In short, success breeds success.

The component that is often lacking in supportive services programs is the psychological framework conducive to individual growth. We have noted that black students often enter college with ambiguous feelings about the dominant culture, their role in it, and their identity. Since the scientific curriculum offers little opportunity to examine this, counselors must provide the opportunity through formal and informal activities to articulate frustrations and resolve problems. The goal of the counseling component is to develop a feeling of group identity, positive self concept and a sense of control over one's environment and thus one's destiny.

Planning extra-curricular activities is an essential function which creates a sense of camaraderie and togetherness within the school of engineering and off-sets student isolation. Through peer relations, study groups and rap sessions, a sense of belonging and reward for perserverance are developed. Informal discussions about instructors who relate to blacks, understanding course expectations, and displaying science activities by blacks, are necessary for moral support For the dominant culture, scientific fraternities have provided these reinforcements as they help members form study groups, catalogue old tests, keep up with changing course content, rate instructors, and obtain support from alumni. Blacks hesitate to join such organizations and need help in developing similar support structures.

Moreover, in fostering personal growth, counselors should consider the ways in which each student is reinforced. That is, they should determine the areas of ego strengths for each student. Most people's ego strengths lie in one or more of the following areas:

- Loved ones
- Peers
- Group sanctions
- Significant others
- Rugged individualism (egocentrism)
- Luck (breaks, chance)
- Personal achievement
- Wealth or materialism
- Physical attributes (beauty or charisma)
- Instructional traditions
- Power

The factors affecting motivational change vary. For some persons the relationship with a loved one is so dominant that they are scarcely influenced by environmental pressures. For others, peer group approval shapes behavior. For still others, the drive to get ahead and to obtain material things supercedes all other concerns. By making an individual assessment of the areas most critical to each student, the counselor can ascertain the keys to motivation and thus reinforce students accordingly. Obviously, this requires a small counselor-student ratio as a wide variety of

activities must be accomodated. In some cases, the counselor may contact the student's family to reinforce the student's interest in science. In other cases, the counselor may help a student discover the long-range rewards of prestige and financial advancement from a scientific career. Most likely, however, a combination of areas is necessary to heighten motivation in scientific pursuits.

Aside from planned efforts for personal development, the counselor is critical to the supportive services model as a non-authoritarian figure on whom the student can always rely as a sympathetic ear to share personal triumphs and problems, and as an extension of the institution's genuine concern for the student.

Related to the counselor's role and yet different is the function of instructors who must serve as a professional role model. Although an authority figure and at times a critic of student performance, the instructors must make a special effort to help black students develop a positive identity with the academic discipline. Since blacks tend to be oriented toward the affective domain, a personal rapport with the instructor is critical to such success. The instructor as a role model brings the subject matter alive; he is a living example of how science and technology are built upon the accumulated knowledge of all persons. Further, the instructor brings a career in science down into the realm of everyday possibility. As opposed to the counselor's neutral ear, the instructor-role model can share with the student the agonies and ecstacies of mastering the subject matter and challenge the student to utilize his potential.

Although it is desirable to expose students to successful black scientists, non-black faculty can also be effective role models if they show geniune understanding and appreciation of cultural differences without patronization. For black students they can foster a sense of belonging in the classroom if they exhibit a multicultural perspective and share with other non-black students the worth and contributions of persons of color. This need not take the form of special units or lectures of Afro-American heritage, which often appear artificial or patronizing, but should be intermittant references, stated as a matter of fact as black contributions or problems impenging on the subject matter. For instance, in the study of evolution, it is a simple matter to note that man and civilization first appeared in Africa, a fact which is often overlooked in standard college textbooks, or to discuss the function of racial differences in geographical migration and climate adaptation. Studying the structure of a cell, one can easily point out the importance of the discovery of Earnest Just, a black scientist, who found that the ectoplasm was equally as important as the nucleus in cell fertilization. By continually interjecting such tidbits, the teacher accomplishes three things: First, he spices up the discipline with personal and historical vignettes; secondly, he communicates to the black student that he is concerned enough to find out about them (many of these points black students themselves do not know); and finally, he encourages a multicultural perspective among members of the dominant culture.

The last component of this supportive services model is the experiential or inductive approach to learning, which introduces scientific concepts from

a concrete rather than a theoretical mode. Many minority students are discouraged by traditional science courses because they have not had the theoretical background experiences. Thus, science presented in an abstract context has little meaning to the student. We propose that a hands-on research project in the area of the student's interests (such as making a radio) be supervised by the instructor. As the student runs into problems, the instructor can explain the theory which solves the problem, and then progress toward the theoretical concept on the entire research project. This approach not only can help students grasp the relevance of theory, but it also offers some immediate reward, a tangible product, for their endeavors. Further, this approach seems more consistent with the philosophy of science itself. It is ironic that science, which prides itself on the inductive method, on first observing and collecting empirical data and then drawing conclusions or theories, is most often taught by the deductive method. The student is immersed in theory before seeing its operations in the concrete. Although engineering schools have greatly utilized experiential learning through cooperative education programs, the opportunity to apply and practice theories usually comes later in the student's college career. We propose that from the beginning a student be given a tangible project in which to explore scientific concepts.

Such an approach may obviate reinforcement of middle class biases and expectations that causes teachers to label students as slow or disinterested in science. Frank Reisman pointed out that a pupil may be slow because he is extremely careful, meticulous, or cautious. He may be slow because he refuses to generalize easily, or he may be slow because he cannot understand a concept unless he does something physically, for example with his hands. This points to teaching and learning modes congruent with the attributes of subcultural groups which can heighten motivation and maximize potential.

The proposed model, encompassing recruitment, financial aid, tutoring, counseling, instructor role models, and experiental learning, necessitates institution-wide commitment to increasing the number of black science and engineering graduates. It means that all components of the institution (not merely the minority recruitment office) assume responsibility for student retention and achievement. Such an approach would make success routes for blacks more meaningful without compromising the institution's academic standards.

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